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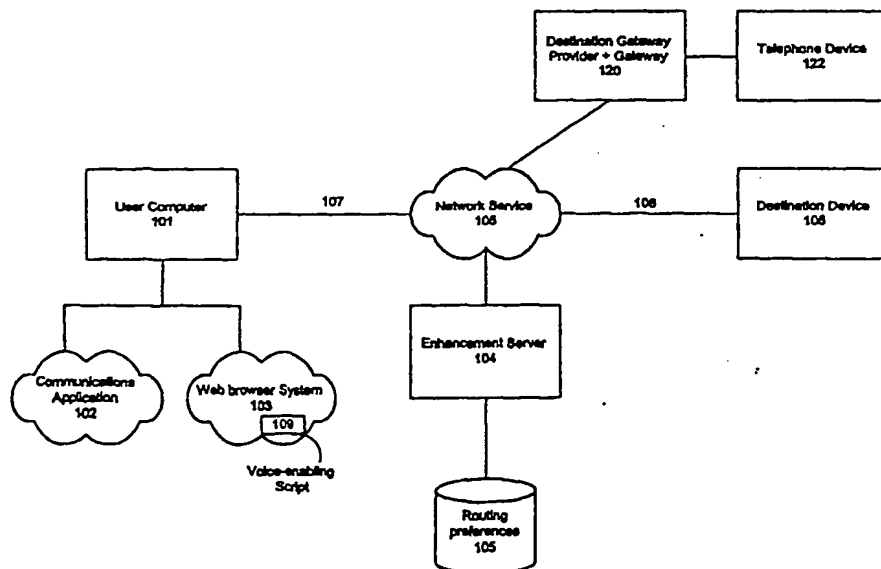
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(54) Title: UNIVERSAL INTERNET VOICE ADDRESSING SCHEME

(57) Abstract

A system and method for allowing caller to initiate a voice communication to a recipient over a network comprises a voice address associated with the recipient and a voice communicator window for providing to the caller available communication options for initiating a voice communication with the recipient. The voice address may take a variety of forms such as a voice enabling button or a URL and enables the caller to establish a voice communication with the recipient. The voice communicator window provides the caller with available communication options for contacting the recipient. The communication options

provided in the voice communicator window and available to a particular caller are predetermined by the recipient using routing preferences. Thus, the recipient may allow communication options to a caller based on information such as the identity of the caller, the time of day or week, or other contextual information. A caller initiates a voice communication with the recipient by activating a voice address associated with the recipient. In response, a voice communicator window is provided to the caller indicating the available communication options. The caller selects a communication option from the voice communicator window and a voice communication with the recipient is established.



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UNIVERSAL INTERNET VOICE ADDRESSING SCHEME

RELATED APPLICATIONS

The subject matter of this application relates to and claims priority, under 35 U.S.C. §119(e), from provisional application number 60/122,509, entitled "Enhanced Internet URL and Button Voice Connection" by Ede Phang Ng, Sng Khoon Heng, Pan Hong and Poh Yoke Lai, which application was filed on March 3, 1999, which is incorporated herein by reference in its entirety, and from provisional application number 60/171,886 entitled "Universal Voice Addressing Scheme" by Tong-Tse Young and Jin-Ho Tan, which application was filed on December 23, 1999, which is incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

The present invention relates generally to voice communications over a network, and more particularly, to a method and system for a universal voice addressing scheme for voice communications over a network.

BACKGROUND OF THE INVENTION

World Wide Web pages often contain graphical buttons or Universal Resource Locators (URLs) that, when selected by a computer user, enable the user to send an e-mail message to the owner of the web page. The button or URL acts as a macro to launch a mail program, installed

on the user's computer, with a predetermined destination address. The Web also has typing chat services, where a computer user clicks a button and joins a group of people who are typing messages back and forth.

The area of voice communications via the internet is recently being explored. However, the procedure for initiating calls via the internet is not very efficient. The value that can be added by utilizing the internet for voice calls is not being fully exploited. In addition, while internet calls are a convenient and cheap way of facilitating communications, the nature of the web itself creates some special problems for voice communications on the internet.

One such problem is that due to the continuous, seamless and global nature of the web, it is entirely possible for a user in one time zone to call a user in a different time zone. In fact, the caller may be calling during the day, but it may be night-time for the party being called. This problem is aggravated because people using the internet often do not disclose their true identity or location, and the caller may thus not even be aware of this fact. These factors may result in the party called being disturbed while she is sleeping, or at an otherwise inopportune time. Moreover, the cheap and global nature of web-based calls makes it very easy for a party to be located and contacted for any form of conversation – serious or light. This can ultimately be distracting, disruptive, or downright annoying to the party being called. There thus exists a need for a system and a method by which the party being called can control and restrict the calls she receives.

Customers encounter problems with conventional voice communications systems when they call companies and try to contact the desired representative or contact within the company. Such customers often face long holding periods while the company operators struggle to

appropriately route a large number of incoming calls. Considering the delays and frustration that many such customers experience when trying to reach the appropriate number through a company's conventional telephone service, there exists the need to facilitate the routing of web-based voice calls.

Yet another problem with conventional voice-call systems is that the caller needs to know the destination number to be called in order to place the call. However, individuals or companies being called may want to be reachable by phone, and yet desire to keep their destination number private from the callers, and also to determine how to route calls from certain callers. Thus there exists a need for a system and method which allow a party to have the freedom to openly publish contact information, while still being able to direct callers through preferred methods of contact.

In addition, another problem with current voice-calling systems is that one destination number is generally connected to a single destination or a single conference group destination. When the destination is busy, current solutions can merely return either a busy indication to the caller, or can do telephone-style handling like call-waiting or an automatic switch to a voice message system. It may be desirable to have added functionality, such as routing calls between a group of representatives serving the same or similar functions in a company. The calls may need to be divided amongst the representatives in a pseudo-random order, for example, to facilitate an even distribution of calls. Alternately, some situations may demand a certain order in which the various representatives receive calls. In any case, there exists a need for allowing a single destination address to be directed to a bank of receiving people and devices, or permitting the party being called to dynamically change the destination to which a pointer (such as a web-button or a URL link) points.

Considering the marketing value and cost savings involved for companies presenting personalized web services and advertising to customers, it is desirable to extend these abilities to voice calls initiated from the web. Thus there exists a need for a web-based voice connection and voice addressing scheme, with enhanced features such as prioritizing and/or routing incoming calls based on user-defined parameters, or on other contextual information, such as caller location, computer type or calling capabilities.

SUMMARY OF THE INVENTION

The limitations described above in the existing web-based voice communication methods are overcome by the present invention. The present invention comprises a voice addressing scheme for communications over a network, such as the Internet.

The present invention has the advantage of providing for flexibility and portability in providing an addressing scheme for voice communications over the Internet. The present invention provides a unique voice address for a recipient or callee. In other words, a recipient, such as an individual or a company, is provided with a unique voice address which enables a caller to establish voice communications with that recipient. The unique voice address allows the caller to communicate with the recipient using a variety of communication options that have been pre-selected by the recipient. For example, the voice address may enable voice communication between the caller's personal computer and a variety of destination devices via a network service such as a wide area network (for example the Internet) or a local area network (for example an Intranet). A voice address may take a variety of forms such as a voice enabling button that can be easily embedded into any HTML web page, or a URL of a voice-enabled web

page that can be placed anywhere that hot-linked text or graphics can be embedded, such as within an e-mail message or a Microsoft Word document. A caller desiring to contact the recipient can initiate a voice communication by activating the voice address, for example, by clicking on a voice enabling button, or by entering the voice address into a browser.

Activation of a voice address opens a voice communicator window. The voice communicator window provides communication options available to the caller. For example, the voice communicator window may provide three options for contacting the recipient: 1) pc-to-pc communication; 2) pc-to-telephone; or 3) voicemail. Other possible modes of communication available in the voice communicator window include a wide variety of possible voice call destinations, such as another personal computer (PC), a telephone, a bank of telephones, a voice conference system, a voice mail account, or an email account. Additionally, the present invention may be used to communicate with mobile phones and handheld devices.

The communication options available to a caller in the voice communicator window are preferably predetermined by the recipient. Thus, the recipient may establish communication options available to a particular caller, based on the identity of the caller, the time of day or week, destination device status information, and/or other variables, such as contextual information. For example, a company might set up its routing preferences so that customers calling during business hours are directed to live customer representatives, while those calling after business hours may be directed to a 24 hour hotline. On the other hand, employees calling at any time may be directed to their voice mail accounts. Thus, the present invention advantageously allows a company to publish a single unique voice address, and still be able to direct voice calls with minimal disruption. Another advantage of such an embodiment is that

caller identification information can include data that cannot be obtained with standard voice connections, such as the user's name and the Web page the user might have been viewing at the time of the call. Such recipient-defined communication options can be accomplished by means of routing preferences stored on an enhancement server or destination device. These routing preferences can be updated at will by an authority with access to the enhancement server.

In one embodiment of the present invention, a unique Multipurpose Internet Mail Extensions (MIME) file type is registered with the browser. This makes it possible to start an application and to pass it the data automatically when such a MIME data file is sent to the browser. Moreover, an intelligent web page can check for the existence of a MIME registration, and take different actions depending on whether or not it is found.

In another embodiment of the present invention, it is possible to make a voice call to a PC even though the party being called is not logged on to the web at that time. In this embodiment, the present invention provides for a way in which the caller may be able to "wake" an off-line destination PC and put the voice call through.

Further, the party being called does not need to disclose its phone number or any other personal identification information to the callers. Instead, the callers can place a call merely by using the voice address, which could dynamically point to different destinations as per the directions of the party being called.

In yet another embodiment of the present invention, it is possible to create a web-based "voice hunt group." In other words, the invention allows an Internet phone number to be shared among a bank of receiving people. In such a situation, it becomes possible to direct a call accurately. For instance, if a voice address were shared between a group of customer

representatives, calls from customers could be channeled to the different representatives in a pseudo-random order to evenly distribute the load. Alternately, it is also possible to channel the calls in an orderly sequence.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a block diagram of a system for implementing a voice addressing scheme in accordance with an embodiment of the present invention.

FIG. 2 shows one embodiment of implementing a voice address as a graphical user interface containing a web-button for establishing a voice communication over a network.

FIG. 3 shows one embodiment of implementing a voice address as a URL for establishing a voice communication over a network.

FIG. 4 shows a sample caller matrix.

FIG. 5 is a flowchart illustrating ordered routing of a call in accordance with one embodiment of the present invention.

FIG. 6 is a flowchart illustrating one embodiment of a method of initiating a voice communication using a voice address in accordance with the present invention.

FIG. 7 shows one embodiment of a voice communicator window.

FIG. 8 is a flowchart illustrating one embodiment of a method for initiating a voice communication via a voice address embedded in a web button.

FIG. 9 shows a flowchart illustrating one embodiment of a method for initiating a voice communication via a voice address embedded in a URL.

DESCRIPTION OF THE INVENTION

The present invention provides a voice addressing scheme for enabling voice communications over a network, such as the Internet. In one embodiment, each individual user is provided with a unique voice address. Alternatively, a unique voice address may be assigned to a company or to a group of individuals. The voice address allows a caller to establish a voice communication with the recipient or callee (i.e. the owner or user of the voice address). For example, the voice address may allow a caller to contact the recipient using a personal computer ("pc")-to-telephone connection or a pc-to-pc connection. Alternatively, the voice address may allow the caller to contact the recipient using voicemail. The voice address may also allow the caller to contact the recipient's mobile telephone or other handheld device. The present invention is not limited to providing only voice communications, but may also include other types of network communication such as email or fax. Thus, the voice address advantageously provides a unique address which may be used to contact one or more different destination devices. As a result, the owner of a voice address may distribute to others only one voice address that can be used to contact the owner. A caller desiring to contact the owner of a voice address need only remember the voice address to contact the owner and does not need to remember different numbers for various different destination devices.

A voice address is preferably a unique identification. A voice address may take a variety of forms such as a voice enabling button that can be easily embedded into any HTML web page, or a URL of a voice-enabled web page that can be placed anywhere that hot-linked text or graphics can be embedded, such as within an e-mail message or a Microsoft Word document. In

a preferred embodiment, the voice address comprises a URL format such as http://domainname/userID where http refers to hyper text protocol, "domainname" refers to the domain name of the server providing the voice addressing scheme (e.g. Mediarling.com), and userID refers to the unique identification. Alternatively, a voice address may comprise a URL format such as voiz://userID where "voiz" is a custom protocol that is registered with the Internet Engineering Task Force (IETF), and the userID is a unique identification which relies on existing protocols. Other examples of a voice address include: http://callme.mediaring.com/userID, talk://switch1.mediaring.com/userID, talk://userID, voiz://switch1.mediaring.com/userID. Thus, a caller desiring to contact a recipient can initiate a voice communication by first activating the voice address, for example, by clicking a voice enabling button, or by entering the URL into a web-browser.

Activation of a voice address, such as a voice enabling button or a URL of a voice-enabled web page, opens a voice communicator window. The voice communicator window provides communication options available to the caller. For example, the voice communicator window may provide three options for contacting the recipient: 1) pc-to-pc communication; 2) pc-to-telephone; or 3) voicemail. Other possible modes of communication available in the voice communicator window include a wide variety of possible voice call destinations, such as a mobile telephone, a handheld device, a bank of telephones, a voice conference system, a voice mail account, or an email account.

The communication options available to a caller in the voice communicator window are preferably predetermined by the recipient. Thus, the recipient may establish communication options available to a particular caller, based on the identity of the caller, the time of day or

week, destination device status information, and/or other variables. For example, a company might set up its routing preferences so that customers calling during business hours are directed to live customer representatives, while those calling after business hours may be directed to a 24 hour hotline.

Figure 1 shows one embodiment of a system in accordance with the present invention. Figure 1 includes a user computer system 101, a network service 105, an Enhancement server 104, a routing preferences database 105, a destination device 106, a destination gateway provider and gateway 120, a telephone device 122, and links 107 and 108. The user computer 101 is equipped with a communications application 102, and a web browser system 103. The user computer 101 uses the communications application 102 to initiate a voice call to the destination device 106 or to the telephone device 122, via the network service 105. From here on in, for simplicity, the destination device 106 will be used to refer to any type of destination device 106 or telephone device 122. One skilled in the art will realize that the present invention is not limited to a specific type of destination device. An Enhancement subsystem or server 104 is in communication via the network 105 with the user computer 101, the destination device 106, and the telephone device 122. In one embodiment, the enhancement subsystem 104 may incorporate the client systems as well to provide a more efficient system. The enhancement server 104 also has access to a routing preferences database 105. In an alternate embodiment, the routing preferences database 105 may be stored on the destination device 106 itself or on the destination gateway provider and gateway 120.

The user computer 101 is a conventional computer system that may include a computer, a storage device, a network service connection, and a conventional input/output device such as, for

example, a display, a mouse, a printer, and/or a keyboard that may be coupled to a computer system. It may be available from, among others, IBM Corporation, Sun Microsystems, Inc., Hewlett-Packard, Inc., or Compaq Computer Corporation. The user computer 101 may also include a conventional operating system and network services software. The network service connection includes those hardware and software components that allow connection to a conventional network service such as the Internet or an Intranet. One skilled in the art will realize that the present invention is not limited to computer networks such as an Internet or Intranet, but that the principles of the present invention may also be used with wireless communication devices, such as mobile phones and handheld computing devices.

The communications application 102 is a software application that a user (i.e. the caller) installs on the user computer 101. The communications application 102 communicates with the enhancement server 104, and sends a voice communication request after decoding the desired destination and any other specified options. The communications application 102 may receive destination information such as the recipient's encrypted phone number through, in one embodiment, MIME type file streamed from the Enhanced Server 104. The communications application 102 decodes this information and sends the call request to the destination device 106. In one embodiment of the present invention, the communications application 102 could be a stand-alone application program. In another embodiment of the present invention, the communications application 102 could be a plug-in to the web-browsing functionality. In yet another embodiment, it could be a downloadable Java applet.

In one embodiment of the present invention, the communications application 102 has a unique MIME type associated with it. This MIME type is registered with the web browser

system 103 on the user computer 101. The MIME type is instrumental in checking whether the communications application 102 is installed on the user computer 101, and in taking different actions based on the result. If the communications application 102 is properly installed on the user computer 101, it is automatically started. On the other hand, if the communications application 102 is not properly installed on the user computer 101, the user is given the option of downloading and installing the communications application 102 onto the user computer 101. The details of how these functions are performed are discussed below in reference to Figures 8 and 9.

The web browser system 103 is configured to provide the user computer 101 with access to resources accessible through the network service 105. The network service 105 is a network configuration, for example, an Internet or Intranet or a local or proprietary network. In one embodiment, the web browser system 103 could be implemented as a separate application such as, for example, Internet Explorer™ by Microsoft Corporation or Netscape Navigator™ by America Online, Inc. Alternately, it is noted that the web browser system 103 may be embedded in some other application on the user computer 101.

The Enhanced Server 104 can be any conventional server. The Enhancement Server 104 serves as a gatekeeper for the user computer 101. A gatekeeper authenticates a user when he or she goes online and stores his or her online information. The gatekeeper also provides the user's online location when another user tries to contact him or her. The Enhancement Server 104 sends a web page that contains a voice enabling script 109 to the web browser system 103 on the user computer 101. The voice-enabling script may be an embedded function on the web page that the enhancement server 104 returns. When a caller uses the user computer 101 to initiate a

voice communication to the destination device 106, he or she activates the voice-enabling script 109. An example of such a script is provided in Appendix A. The voice-enabling script 109 can be activated in one of several ways. In one embodiment of the present invention, the voice-enabling script 109 may be activated via a voice-enabling button 201 displayed on a web page as shown in Figure 2. In another embodiment, the voice-enabling script may be activated automatically upon loading a web page. In yet another embodiment, the voice enabling script can be activated using web links (either text or graphics) or as a URL link 301 as shown in Figure 3. Such a link could be embedded in a web page just like a web-button. In addition, such a link could also be embedded in a directory listings of users, in an email message, in a help file, or in any other application supporting web addresses. The steps taken to implement these different embodiments are further described below in reference to Figures 7, 8, and 9.

Link 107 connects the user computer 101 to network services 105 and link 108 connects the network service 105 to the destination device 106. Links 107 and 108 include both hardware and software components that allow for connecting the user computer 101 to a conventional network service. For instance, the network service connection 107 could include a modem or a digital subscriber line ("DSL") connection and an Internet Service Provider ("ISP") account or an Ethernet peripheral card and a local area network connection and account.

The routing preferences database 105 contains the preferences of the party being called (the "callee" or "recipient"), as to how, when and where the recipient's calls should be routed. In one embodiment of the present invention, the routing preferences database 105 resides on the enhancement server 104. In an alternate embodiment, the routing preferences database 105 resides on the destination device 106.

The routing preferences database 105 may be updateable by the recipient, or by any other authorized agents. The privileges and permissions can be changed at will by the recipient, or by any of his authorized agents who have access to communicate with the enhancement server 104. In one embodiment, the routing preference database 105 may be updated through an administrative web page with a password. In another embodiment, the modification may take place through an email responsive system. In still another embodiment, it may be possible to update the routing preference database 105 by calling an administrative operator.

The preferences contained in the routing preference database 105 may depend on several factors such as the identity of the caller, the time of day or week, destination device status information, and/or other variables. By referring to Figure 1 it can be seen that the routing preferences are accessible to the Enhancement server 104, which in turn is in communication with both the user computer 101 and the destination device 106.

In one embodiment of the present invention, the routing preferences database 105 can be used in conjunction with a functionality which makes it possible to "wake" an off-line destination computer in conventional manner. In other words, even if the recipient is not online, it may still be possible to put the call through. One advantage of this is that the recipient does not have to remain online all the time in order to receive its calls. However, due to this ability to contact a destination device at any time, it is important that the recipient be able to prevent disturbances from calls at inopportune times. It is possible to achieve this by appropriately setting preferences in the routing preference database 105.

In another embodiment, it is possible to use the routing preferences database 105 in a company, which might set up its routing preferences so that customers calling during business

hours are directed to live customer representatives, while those calling after business hours may be directed to a 24 hour hotline. On the other hand, employees calling at any time may be directed to their voice mail accounts. A company can thus publish a unique voice address, such as a single voice enabled button or URL, and still be able to direct voice calls with minimal disruption. Another advantage is that these call privileges allow recipient to have the freedom to openly publish the voice address, while still being able to direct callers through preferred methods of contact.

In one embodiment, the routing preferences contained in the routing preferences database 105 include available communication options and communication privileges established by the recipient. Communication options permit the recipient to select how she should be contacted when a caller attempts to make a call using the voice address. Some options that may be available to the caller include: no call, voice call, voice mail, voice mail with email notifications, and email. The "no call" option specifies that the recipient does not wish to be contacted at all. If a caller tries to make a call when such an option is in place, he will merely be informed by the web page that the recipient does not wish to be contacted at that time. A recipient could exercise such an option at times when he might be busy or sleeping, or based on caller specific information (that is, she does not wish to speak to certain callers, but is willing to speak with others). The "voice call" option implies that the recipient is willing to receive voice calls. The voice call option may allow the caller to initiate a voice communication using any method such as a pc-to-pc connection, or a pc-to-telephone connection. The recipient may select which voice communication options are available to a user based on such information as time of day or week, caller identification or other information. Under the "voice mail" option, voice calls may be

disabled and voice mail is automatically invoked. The caller is accordingly prompted to start recording his message. The "voice mail with email notification" option is one that supplements the recording of the voice message with automatically sending the recipient an email notification when she receives a voice message. In one embodiment of the present invention, the recipient can merely click on the email message link (web button URL) and be directed to an HTML page which allows her to playback her voice mail message. The "email" option may indicate that the caller may only send the recipient an email message. One skilled in the art will realize that the present invention is not limited to the specific communication options listed here, but may include any variety of available communication options as known to one skilled in the art.

In conjunction with such communication options, the recipient can also set communication privileges. These privileges may depend on, for instance, the time of day, the day of the week or the date, and caller specific information. Multiple number filtering privileges may also be set. Time of the Day restrictions allow for the types of call actions to be restricted based on the time of day at which the call is placed. Since the recipient is setting up the preferences, if the caller and callee are in different time zones the calls are restricted based on the callee's local time zone. The Day of the Week or Date restrictions allow a recipient to restrict call actions based on the day of the week or the date. The privileges may also be restricted based on caller specific information. This caller specific information can include restrictions based on caller identification or other contextual information such as caller location, the caller's computer, or the caller's calling capabilities. In addition, another advantage of such an embodiment is that caller identification information can include data that cannot be obtained with standard voice connections, such as the user's name and the web page that the user might have been viewing at

the time of the call. Hence it is possible, for instance, to restrict calls based on the web-page that the user was viewing when he placed the call. This gives the recipient the advantage of giving out a single voice address for multiple purposes, such as for business and personal calls. For example, the recipient can then direct calls initiated from his business web-site to his voice mail outside of business hours, and still receive voice calls if they are initiated from his personal web-site.

As can be seen from this example, these different privileges can be used in conjunction with each other as well as with the different types of communication options. For instance, a recipient could set up a preference pattern such as allowing all voice calls from 9am to 6pm on weekdays, except for Wednesday afternoons, when voice messages with email notifications are permitted. The preference pattern could be even more complex, such as receiving only emails from most callers on holidays such as Thanksgiving and Christmas, but always permitting voice calls from certain chosen callers. In one embodiment of the present invention, such call patterns can be determined based on a Caller Matrix. The Caller Matrix is a matrix of actions which allows the recipient to specify the times and days in which to allow certain call actions. In one embodiment of the present invention, the time is specified in half-hour segments, and the caller matrix is a $48 * 7$ matrix. Figure 4 illustrates one example of a caller matrix. One skilled in the art will realize that a Caller Matrix is not limited to the example shown in Figure 4 but that there are a variety of ways in which a recipient (i.e. the owner or user of a voice address) may configure a Caller Matrix. For example, instead of having only one or two communication options available during a specified time slot, a recipient may allow three or for different communication methods during a particular time slot.

Referring to Figure 1 again, the destination device 106 can receive a voice call initiated by the user computer 101. It is noted that the destination device 106 can be one of several different types of devices, or even a collection of such devices. One possible destination device 106 includes a personal computer equipped with a voice communications application, similar to communications application 102. In another embodiment, the destination device 106 may be a voice mail account or an e-mail account. In one embodiment, the destination device 106 may be a voice conference facility. Each destination device in the voice conference facility can participate in the voice call. The destination device 106 may also be a standard telephone such as telephone device 122. The standard telephone device 122 may be coupled to a destination gateway provider and gateway 120 which in turn is coupled to network service 105. The destination gateway provider and gateway 120 serve as an intermediary for placing a voice communication from a user computer 101 to the telephone device 122. A gateway 120 is typically a computer system or network that provides for communication to PSTN telephones 122. MCI and Sprint are examples of gateway provider companies. Via the destination gateway provider and gateway 120, a user computer 101 may initiate a voice communication with a telephone device 122. In one embodiment, telephone device 122 may be comprised of a phone bank (that is, a collection of telephones) and a voice communication may be routed to any one of these telephones. Thus, a single voice address may be shared amongst the bank of receiving devices by routing calls amongst them.

As shown in Figure 5, in one embodiment of the present invention, calls can be channeled to the recipients sharing a voice address in an orderly sequence. Once an incoming call is detected 510, the system must determine to which receiver to route the call. If the routing is set

to occur in an orderly sequence, the system will check 520 whether receiver one is available. If receiver one is available, the system will route 530 the incoming call to receiver one. If receiver one is not available, then the system will check 540 to see whether receiver two is available. If receiver two is available, the system will route 550 the call to receiver two. If receiver two is also not available, the system will check 560 whether receiver three is available. If receiver three is available, then the system will route 570 the call to receiver three. If no receivers are available, the system may return 580 a message to the caller indicating that the call cannot be received at the present time as all recipients are busy.

In another embodiment of the present invention, calls can be channeled to the people sharing a voice address in a pseudo-random sequence. Such a pseudo-random ordering of calls may, for instance, facilitate an even distribution of the load amongst the receivers. For example, a bank of customer representatives may be able to use such a feature to distribute the calls of the customers evenly amongst them. These embodiments can be further extended with features that permit receivers to log in as being available, off-duty, and so on.

In still another embodiment, the receivers can be prioritized in groups to receive calls. For instance, this may help in allowing secondary coverage of peak load. If there were, for example, two groups of service personnel – a primary and a secondary – it may be desirable to have the calls distributed randomly amongst the primary group during normal operations. At this point, the secondary group would not be receiving any calls at all. However, if the call load exceeded the number of people in the primary group, then a service-oriented company may choose to forward the calls to other employees in the secondary group. These secondary group employees will then interrupt their normal tasks to service these peak customer needs.

Figure 6 depicts a flowchart illustrating one embodiment of a method of the present invention. A caller desiring to establish a voice communication with a recipient activates 602 the recipient's voice address. As described above, the present invention provides a unique voice address for each recipient. The voice address may take a variety of forms such as a voice enabling button that can be easily embedded into any HTML web page, or a URL of a voice-enabled web page that can be placed anywhere that hot-linked text or graphics can be embedded, such as within an e-mail message or a Microsoft Word document. A caller desiring to contact the recipient can initiate a voice communication by first activating the voice address. In other words, the caller may click on a voice enabling button containing the voice address, or enter the URL voice address into a web browser. The voice address information is sent to the enhancement server 604. The enhancement server 604 evaluates the voice address and information and determines whether there are any predefined communication options or routing preferences for that voice address. If routing preferences have been established for the voice address, the enhancement server determines which communication options are available to the caller based on the information provided by the routing preferences database and other parameters, such as caller identification, time of day, etc.... The enhancement server then returns and displays 606 a voice communicator window to the caller. The voice communicator window is typically displayed using a standard internet browser. The voice communicator window displays the communication options available to the caller as indicated in the routing preferences database. For example, the voice communicator window may provide three options for contacting the recipient: 1) pc-to-pc communication; 2) pc-to-telephone communication; or 3) voicemail. The user then selects 608 a communication option from the voice communicator

window preferably by clicking on the icon or URL representing the communication option. The communications application associated with the selected communication option then initiates 610 a communication link with the recipient using the selected communication option.

Thus, the voice addressing scheme of the present invention allows the caller to communicate with the recipient using a variety of communication options that have been pre-established by the recipient. For example, the voice address may enable voice communication between the caller's personal computer and a variety of destination devices via a network service such as a wide area network (for example the Internet) or a local area network (for example an Intranet).

Figure 7 shows one embodiment of a voice communicator window 700 in accordance with the present invention. The voice communicator window 700 displays the communication options available to the user for contacting the recipient. As discussed above, the available communication options are determined by the routing preferences database and other information such as caller identification, caller location or other contextual information. Thus, Figure 7 shows that this particular caller may contact the recipient by establishing a connection with either the recipient's internet phone, the recipient's standard telephone, the recipient's voicemail or the recipient's mobile phone. The options may be displayed as text or icons which the user activates by simply clicking on the text or icon. Each displayed communication option has an associated script, such as a voice-enabling script, for establishing a connection with the destination device. A voice-enabling script is a script which enables a caller to use a web page to make a voice communication. An example of such a script is provided in Appendix A. When the user

activates the selected option, for example, by clicking on the option, the voice-enabling script is activated and a connection is established with the selected destination device.

Figure 8 depicts a flowchart illustrating one embodiment of the present invention. Specifically, Figure 8 illustrates a method for initiating a voice communication using a voice address comprising a voice enabling button. A system in accordance with the present invention receives 801 a request for a web page containing a voice enabling button. The Enhancement Server 104 responds by returning 802 to the user computer 101, a web page containing the voice address in the form of a voice enabling button.

The user clicks on the voice enabling button which sends 803 a communication request to the Enhancement Server 104. The Enhancement Server 104 evaluates 804 the communication request, caller information such as caller identification and caller device, and other contextual information such as location, date, time, etc.... The Enhancement Server 104 compares such information with the routing preferences associated with the voice address and determines 805 which communication options are available to the caller. The Enhancement Server 104 then returns 806 a voice communicator window 700 to the caller which displays the communication options available to the caller. The caller selects a communication option typically by clicking on the text or icon of the selected option. Clicking on the text or icon of the selected option activates 807 a voice-enabling script which enables the caller to use a web page to establish a connection with the selected destination device.

This voice-enabling script checks 808 the web browser to see if the communications application's 102 MIME type is registered. If the communications application 102 is not

installed, the Enhancement Server 104 returns 810 a new page to the user computer 101. This new page contains a button which activates a different voice-enabling script that allows the user to download and install the communications which, when clicked, activates a voice-enabling script that initiates a request for a connection to the destination. If the MIME type is already registered, this is an indication that the communications application 102 is installed on the user computer 101.

Activation of the voice-enabling script sends a communication request, along with destination information, 811 to the Enhancement Server 104. The Enhancement Server 104 responds by sending 812 a MIME data transmission, which includes the destination information that need to be passed to the communications application 102. In one embodiment of the present invention, this MIME transmission may be encrypted. In another embodiment, encrypting the MIME transmission is optional. Such encryption offers the advantage that the destination information and other sensitive data enjoys privacy protection and is not exposed to the caller. The web browser, upon receiving the MIME transmission, will pass 813 it to the communications application 102. If the communications application 102 is not running at this time, it will be started automatically upon receiving the MIME application. The communications application 102 then decodes 814 the information, if necessary, and initiates a connection with the selected destination device using the selected communication option.

Figure 9 depicts a flowchart depicting another embodiment of the present invention. Specifically, Figure 9 illustrates a method for initiating a voice call using a voice address comprising a URL. When a user clicks on an embedded URL in a web page, a system in

accordance with the present invention receives 901 a selection of an embedded web address URL. In an alternative embodiment, the user types the URL directly into Web browser. Clicking or typing a URL sends a communication request to the Enhancement Server 104. The Enhancement Server 104 evaluates 902 the communication request, caller information such as caller identification and caller device, and other contextual information such as location, date, time, etc.... The Enhancement Server 104 compares such information with the routing preferences associated with the voice address and determines 903 which communication options are available to the caller. The Enhancement Server 104 then returns 904 a voice communicator window 700 to the caller which displays the communication options available to the caller. The caller selects a communication option typically by clicking on the text or icon of the selected option. Clicking on the text or icon of the selected option activates 905 a voice-enabling script which enables the caller to use a web page to establish a connection with the selected destination device. The voice-enabling script checks 906 to see whether the communications application 102's MIME type has been registered. If the MIME type is registered, this is an indication that the communications application 102 is installed on the user computer 101. If the communications application 102 is not installed, then as shown in 908, the Enhancement Server 104 returns a new page to the user computer 101. This new page contains a button which activates a different voice-enabling script that allows the user to download and install the communications application 102.

The Enhancement Server 104 then sends 910 a MIME data transmission to the user computer 101. This transmission includes the destination information that need to be passed to the communications application 102. In one embodiment of the present invention, this MIME

transmission may be encrypted. In another embodiment, encrypting the MIME transmission is optional. Such encryption offers the advantage that the destination information and other sensitive data enjoys privacy protection and is not exposed to the caller.

The web browser, upon receiving the MIME transmission, will pass 911 it to the communications application 102. If the communications application 102 is not running at this time, it will be started automatically. Upon receiving the MIME data, the communications application 102 decodes 912 the information, if necessary, and initiates a connection with the selected destination device using the selected communication option.

The foregoing discussion discloses and describes merely exemplary methods and embodiments of the present invention. As will be understood by those familiar with the art, the invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the following claims.

Appendix A. Sample Voice Script:

```

<!-- myTalky Code Block -->
<table border="0" width="80"><tr><td align="center">
<a href="#"
onClick='window.open ("http://mytalky.mediaring.com/cgi-bin/WebObjects/Ta
lkPo
int2.woa/wa/clickme?tpbid=943", "callme", "height=400, width=260, scrollbars
=no"
)'>
<img
src=http://mytalky.mediaring.com/cgi-bin/WebObjects/TalkPoint2.woa/wa/st
atus
image?tpbid=943 height="60" width="120" border="0" alt="Click to call
me"></a>
</td></tr>
</table>
<!-- End myTalky Code Block -->

```

Appendix B. Sample Voice Script

IE:

```

<OBJECT ID="MRVoizMailControl"
NAME="MRVoizMailControl"
CLASSID="CLSID:70F016F3-8BAC-11D3-B741-0000B4A601FB"

CODEBASE="http://vmp2.mediaring.com/voiz/MRVMRec.cab#version=1, 11, 24, 3",
WIDTH="246",
HEIGHT="100",
</OBJECT>

```

Netscape:

```

<EMBED TYPE="application/x-MRVoizMail"
NAME="npMRVM"
callbackevent="CallbackHandler"
WIDTH="246"
HEIGHT="100"
</EMBED>

```

Appendix C: Simple Encryption Routine

```

/*****
/* Input szString, output in szEncrypted. szEncrypted will be twice */
/* the length of szString, so please allocate enough memory. */
void encrypt (char *szString, char *szEncrypted, char *szPassword)
{
int i, pwlen;

```

```
char temp;

    pwlen = strlen (szPassword);
    for (i=0; i<(int) strlen (szString); i++)
    {
        temp = szString[i] ^szPassword [i%pwlen];
        szEncrypted[i+i] = ( (temp>>4) >9? (temp>>4) + 'A'-10:
(temp>>4) + '0');
        szEncrypted [i+i+1] = ( (temp&0x0f) >9 ? (temp&0x0f) + 'A'-10:
(temp&0x0f) + '0');
    }
    szEncrypted [i+i] = '\0';
}
```

CLAIMS

1. A system for allowing a user to initiate a voice communication to a recipient over a network, the system comprising:

a voice address associated with the recipient for initiating a voice communication with the recipient; and

a voice communicator window for providing to the user available communication options for initiating a voice communication with the recipient.

2. The system of claim 1 wherein the available communication options for a particular user are predetermined by the recipient.

3. The system of claim 1 wherein the available communication options include a pc-to-telephone connection, a pc-to-pc connection or a voicemail connection.

4. The system of claim 1 wherein the available communication options are determined by routing preferences.

5. The system of claim 1 wherein the voice address comprises a voice enabling button.

6. The system of claim 1 wherein the voice address comprises a URL.

7. A method for allowing a user to initiate a voice communication with a recipient over a network, the method comprising:

providing a voice address associated with the recipient to initiate a voice communication with the recipient; and

in response to activation of the voice address by the user, providing available communication options to the user.

8. The method of claim 7 further comprising the step of:
in response to the user selecting an available communication option, initiating a voice communication with the recipient.
9. The method of claim 7 wherein the available communication options provided to a user are predetermined by the recipient.
10. The method of claim 7 wherein the available communication options provided to a user include a pc-to-telephone connection, a pc-to-pc connection or a voicemail connection.
11. The method of claim 7 wherein the available communication options provided to a user are determined by routing preferences.
12. The method of claim 7 wherein the voice address comprises a voice enabling button.
13. The method of claim 7 wherein the voice address comprises a URL.
14. A method for allowing a user to select a communication option for establishing a voice communication with a recipient, the method comprising:
receiving a communication request to establish a voice communication with the recipient;

evaluating routing preferences indicated by the recipient, caller information, and contextual information; and
providing communication options to the user.

15. The method of claim 14 wherein the routing preferences are predetermined by the recipient.
16. The method of claim 14 wherein the communication options provided to the user include a pc-to-telephone connection, a pc-to-pc connection, or a voicemail connection.
17. The method of claim 14 wherein the communication request is sent by activating a voice enabling button.
18. The method of claim 14 wherein the communication request is sent by using a URL.

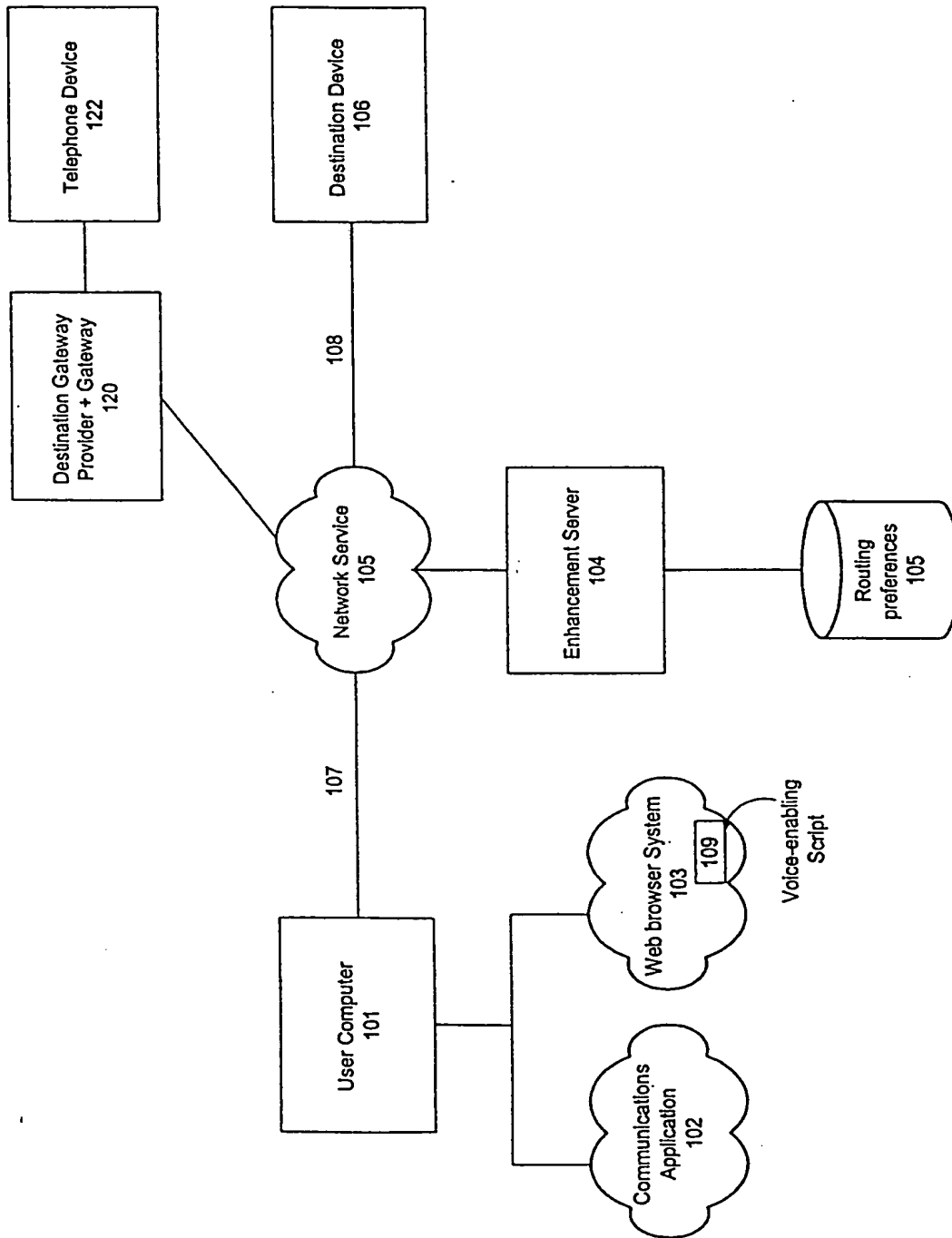


Figure 1

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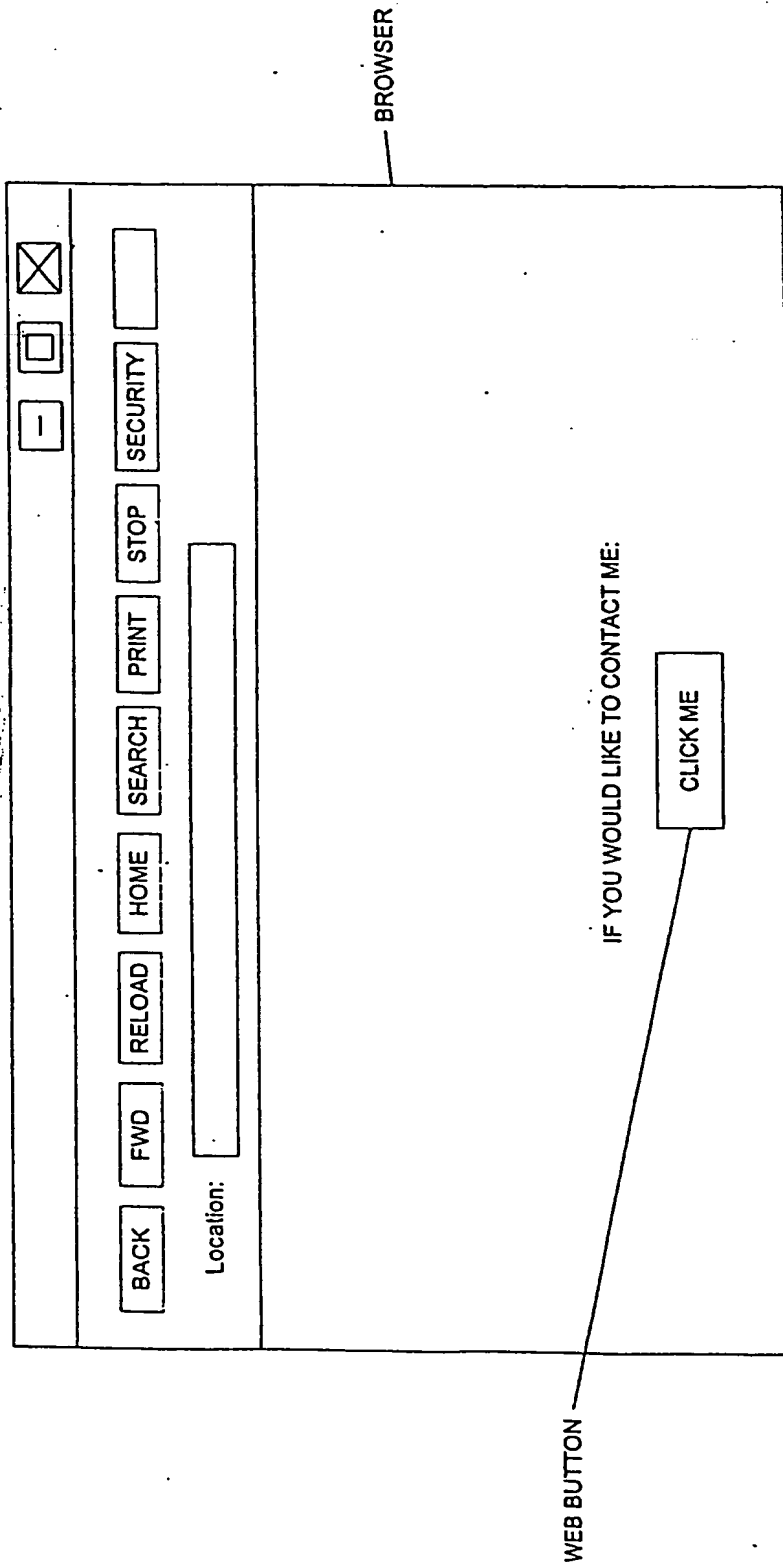
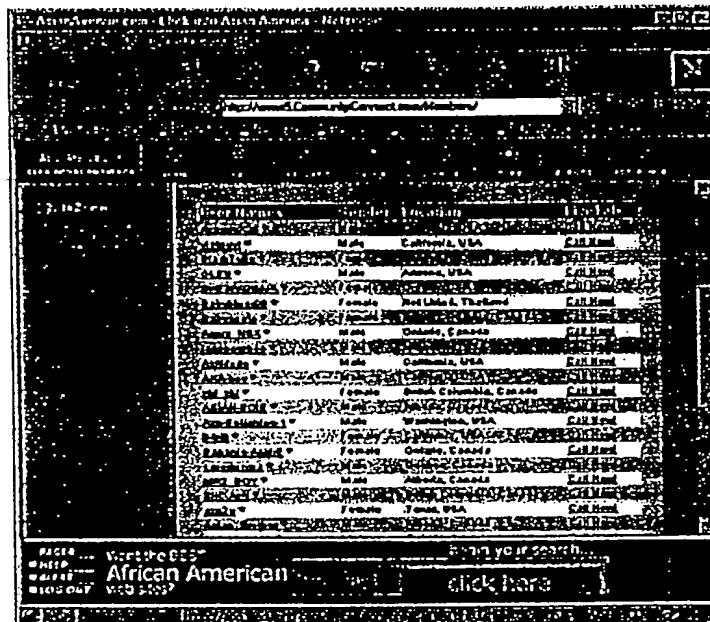


FIGURE 2: WEB BUTTON WITHIN A WEB PAGE

3/11



**Voice-Enabling
URL**

Figure 3

4/11

Figure 4: Sample Caller Matrix

| | Mon | Tues | Wed | Thurs | Fri | Sat | Sun |
|---------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------|------------|
| 0:01 – 2:00 | No Call | No Call | No Call | No Call | No Call | No Call | No Call |
| 2:01 – 4:00 | No Call | No Call | No Call | No Call | No Call | No Call | No Call |
| 4:01 – 6:00 | No Call | No Call | No Call | No Call | No Call | No Call | No Call |
| 6:01 – 8:00 | No Call | No Call | No Call | No Call | No Call | No Call | No Call |
| 8:01 – 10:00 | Voice mail with email | Voice mail with email | Voice mail with email | Voice mail with email | Voice mail with email | Voice mail | Voice mail |
| 10:01 – 12:00 | Voice Call | Voice Call | Voice Call | Voice Call | Voice Call | Voice mail | Voice mail |
| 12:01 – 14:00 | Voice Call | Voice Call | Voice Call | Voice Call | Voice Call | Voice Call | Voice Call |
| 14:01 – 16:00 | Voice Call | Voice Call | Email | Voice Call | Voice Call | Voice Call | Voice Call |
| 16:01 – 18:00 | Voice Call | Voice Call | Email | Voice Call | Voice Call | Voice Call | Voice Call |
| 18:01 – 20:00 | Voice Call | Voice Call | Email | Voice Call | Voice Call | Voice Call | Voice Call |
| 20:01 – 22:00 | Voice Call | Voice Call | Email | Voice Call | Voice Call | Voice Call | Voice Call |
| 22:01 – 0:00 | No Call | No Call | No Call | No Call | Voice Call | Voice Call | No Call |

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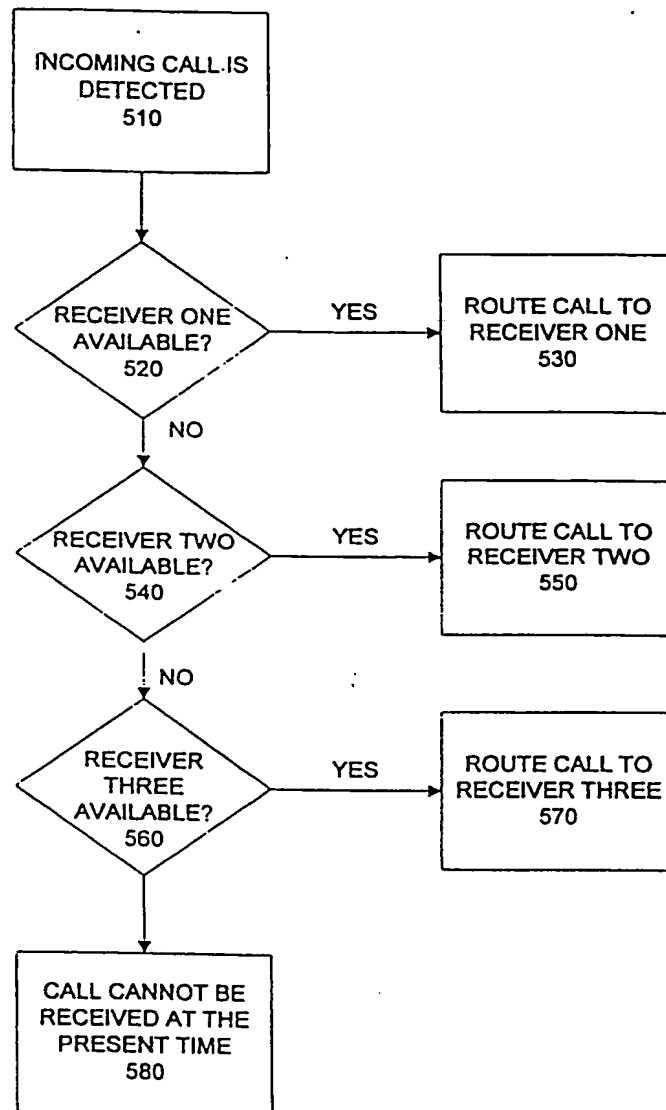


FIGURE 5

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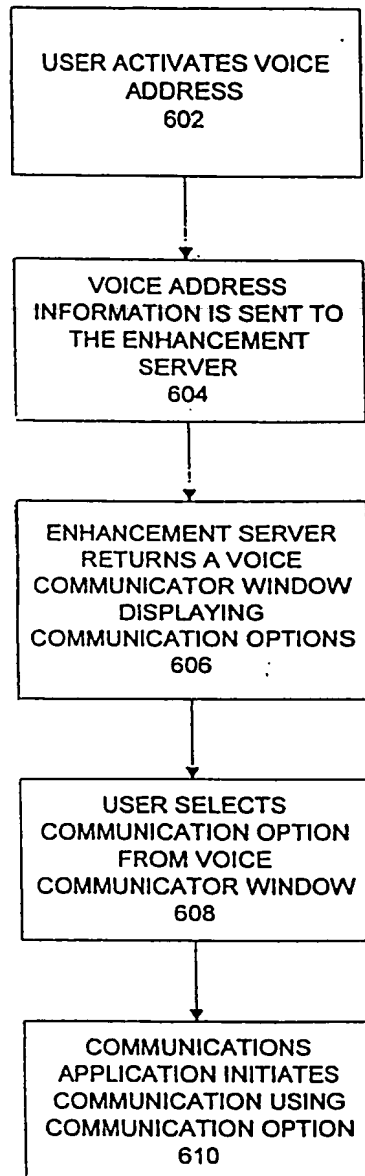


FIGURE 6

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☐

COMMUNICATION OPTIONS

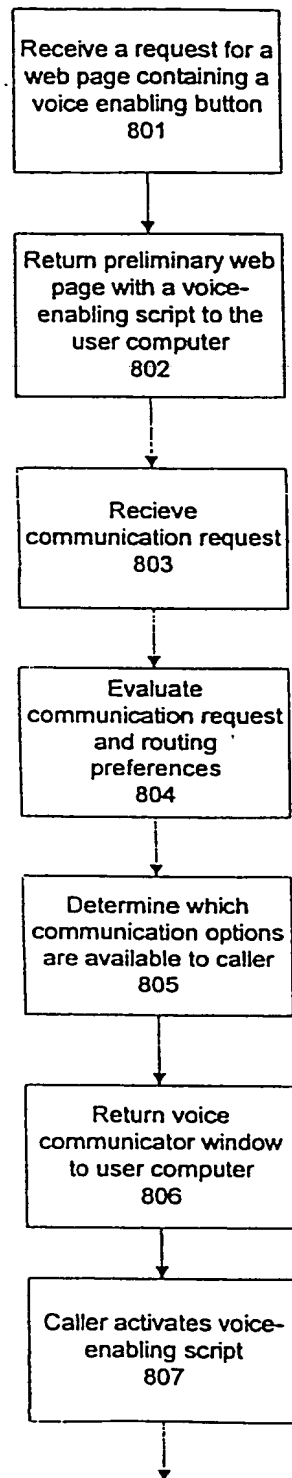
PLEASE SELECT ONE OF THE
FOLLOWING:

1. INTERNET PHONE
2. STANDARD TELEPHONE
3. VOICEMAIL
4. MOBILE PHONE

700

FIGURE 7

8/11



9/11

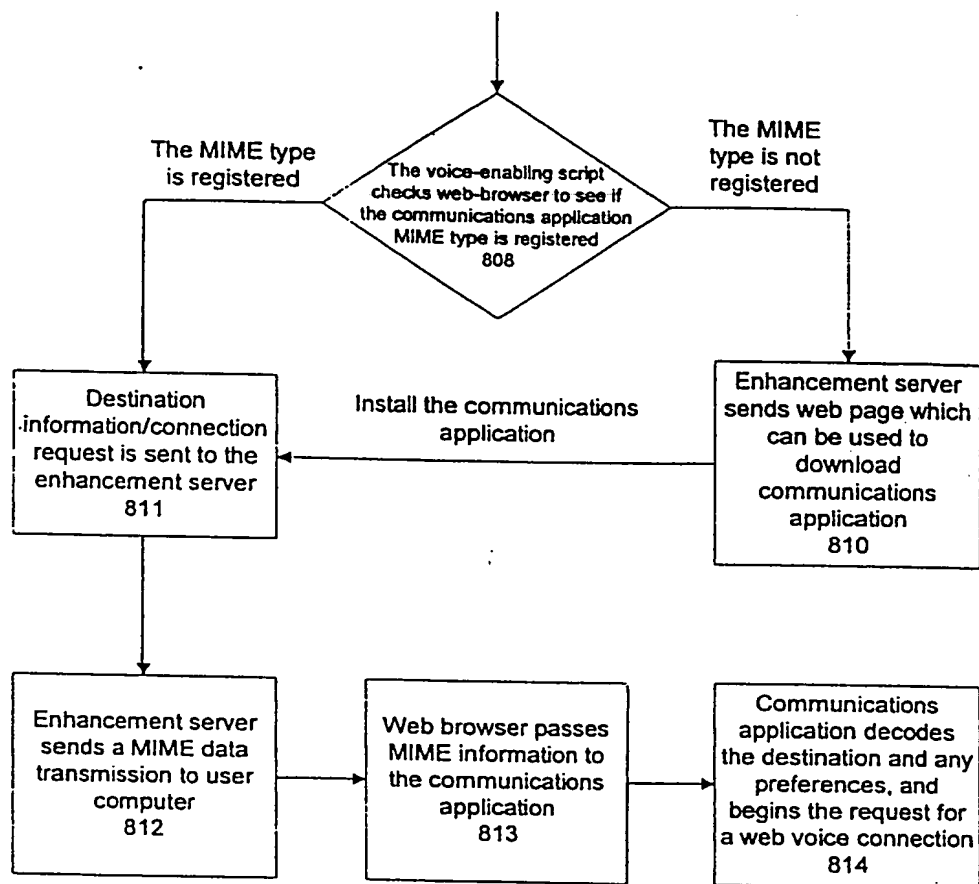


FIGURE 8B

10/11

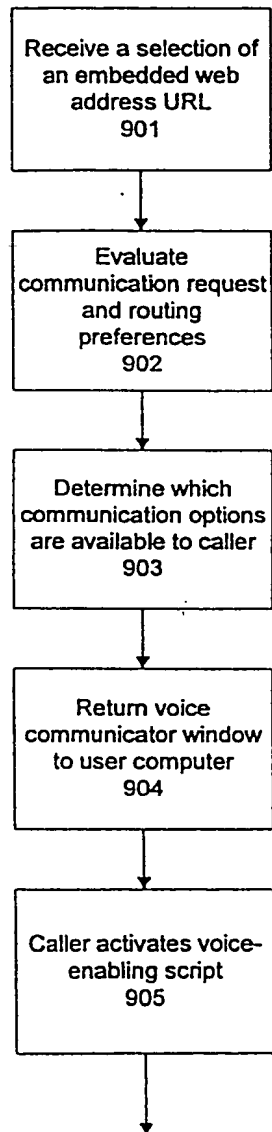


FIGURE 9A

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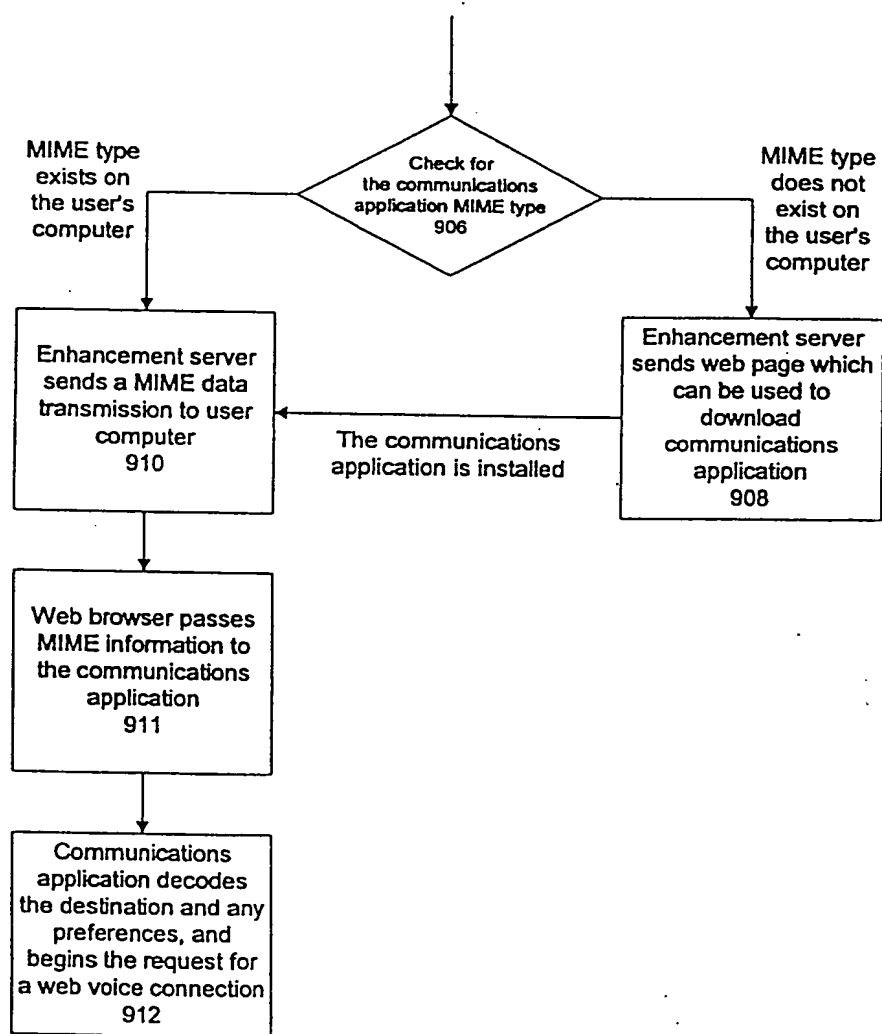


FIGURE 9B

INTERNATIONAL SEARCH REPORT

International Application No

PCT/SG 00/00032

| A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H04L29/06 H04M7/00 | | |
|--|---|--|
| According to International Patent Classification (IPC) or to both national classification and IPC | | |
| B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 H04L H04M | | |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched | | |
| Electronic data base consulted during the international search (name of data base and, where practical, search terms used) | | |
| EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | |
| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X | HOLLEVOET F: "THE ANY-MEDIA CALL CENTRE" BRITISH TELECOMMUNICATIONS ENGINEERING, GB, BRITISH TELECOMMUNICATIONS ENGINEERING. LONDON, vol. 17, no. PART 02, 1 August 1998 (1998-08-01), pages 155-159, XP000777437 ISSN: 0262-401X page 156, middle column, line 1 -right-hand column, line 38 page 157, middle column, line 20 -right-hand column, line 34 | 1-18 |
| A | EP 0 829 996 A (AT & T CORP) 18 March 1998 (1998-03-18) page 8, column 13, line 22 - line 38 -/- | 4, 11, 14 |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. | | |
| <input checked="" type="checkbox"/> Patent family members are listed in annex. | | |
| * Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family | | |
| Date of the actual completion of the international search | | Date of mailing of the international search report |
| 11 August 2000 | | 21/08/2000 |
| Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016 | | Authorized officer Karavassilis, N |

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Int'l Application No
PCT/Sg 00/00032

C:(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. — |
|------------|--|-------------------------|
|------------|--|-------------------------|

| | | |
|---|---|----------------------------|
| A | <p>WO 98 20667 A (TELOQUENT COMMUNICATIONS CORP) 14 May 1998 (1998-05-14) page 6, line 8 - line 18 page 8, line 6 - page 9, line 6 page 12, line 29 - page 14, line 4</p> | <p>1,6,7, 13,14,18</p> |
|---|---|----------------------------|

| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|---|---|---------------------|----------------------------|---------------------|
| EP 0829996 | A | 18-03-1998 | CA 2211908 A | 23-02-1998 |
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International Application No

PCT/Sg 00/00032

Information on patent family members

INTERNATIONAL SEARCH REPORT